

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 69580
CSAH NO. 31
OVER THE
ST. LOUIS RIVER
DISTRICT 1 - ST. LOUIS COUNTY



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
COLLINS ENGINEERS, INC.
JOB NO. 3512 (CEI 1)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 69580, Piers 1 and 2, were found to be in good condition with no structurally significant defects observed. The concrete piers exhibited light scaling from the channel bottom to 3 feet above the waterline with 1/8 inch maximum penetration. A heavy accumulation of timber drift was observed at the upstream nose of Pier 2. The channel bottom appeared to be stable with no evidence of significant scour.

INSPECTION FINDINGS:

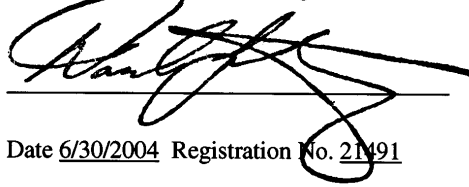
- (A) The concrete at both piers exhibited light scaling with 1/8 inch maximum penetration in a band around the pier extending from the channel bottom to 3 to 4 feet above the waterline.
- (B) A heavy accumulation of timber drift consisting of 2-foot-diameter and smaller logs was observed at the upstream nose of Pier 2 extending from the channel bottom to 3 feet above the waterline.

RECOMMENDATIONS:

- (A) Remove timber debris from around Pier 2 as soon as possible to alleviate flow restrictions, scour influence, and continued accumulation of timber debris at the pier.
- (B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg



Date 6/30/2004 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 69580

Feature Crossed: St. Louis River

Feature Carried: CSAH No. 31

Location: District 1 - St. Louis County

Bridge Description: The superstructure is a three span, multiple prestressed concrete girder bridge supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and two concrete piers. The piers are numbered 1 and 2 starting from the south end of the bridge.

2. INSPECTION DATA

Professional Engineer Diver: Daniel G. Stromberg
State of Minnesota, P.E., No. 21491

Dive Team: Michelle D. Koerbel, Matthew J. Lengyel

Date: August 31, 2002

Weather Conditions: Cloudy, $\pm 70^{\circ}$ F

Underwater Visibility: ± 2 Feet

Waterway Velocity: ± 1 fps

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: Each pier consists of an oblong rectangular shaft with rounded noses, which rest upon a rectangular footing founded on piles.

Maximum Water Depth at Substructure Inspected: Approximately 10.5 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the upstream end of Pier 1.

Water Surface: The waterline was approximately 17.0 feet below reference.
Assumed Waterline Elevation = 83.0.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

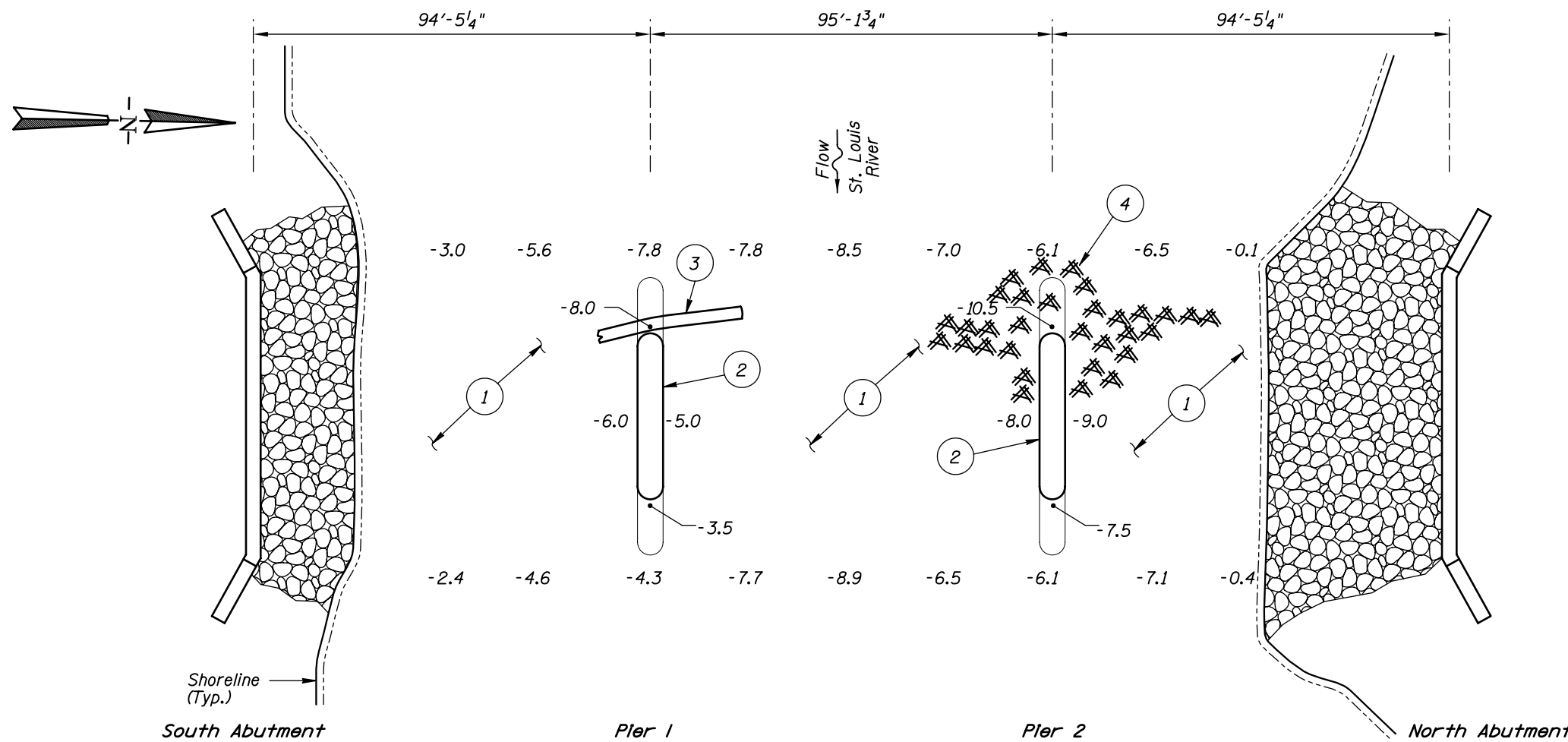
Item 61: Channel and Channel Protection: Code 5

Item 92B: Underwater Inspection: Code B/08/02

Item 113: Scour Critical Bridges: Code I/02

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

_____ Yes X No



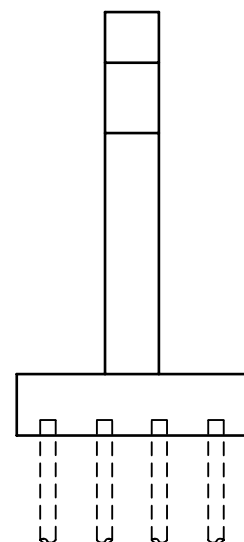
SOUNDING PLAN

GENERAL NOTES:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection on August 30, 2002, the waterline was located approximately 17.0 feet below the top of the cap at the upstream end of Pier 1. Since insufficient bridge elevation information was available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 83.0.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

- 1 The channel bottom material consisted of 1-foot-diameter and smaller riprap and cobbles with no penetration.
- 2 The concrete at both piers exhibited light scaling from 3 to 4 feet above the waterline to the channel bottom with a maximum penetration of 1/8 inch.
- 3 A 6-inch-diameter log was observed on the channel bottom across the upstream nose of Pier 1.
- 4 A heavy accumulation of 2-foot-diameter and smaller timber debris was observed at the upstream nose of Pier 2 extending from the channel bottom to 3 feet above the waterline.



TYPICAL END VIEW OF PIERS

Legend

-8.0 Sounding Depth from Waterline (8/30/02)

Timber Debris

Riprap

**MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION**

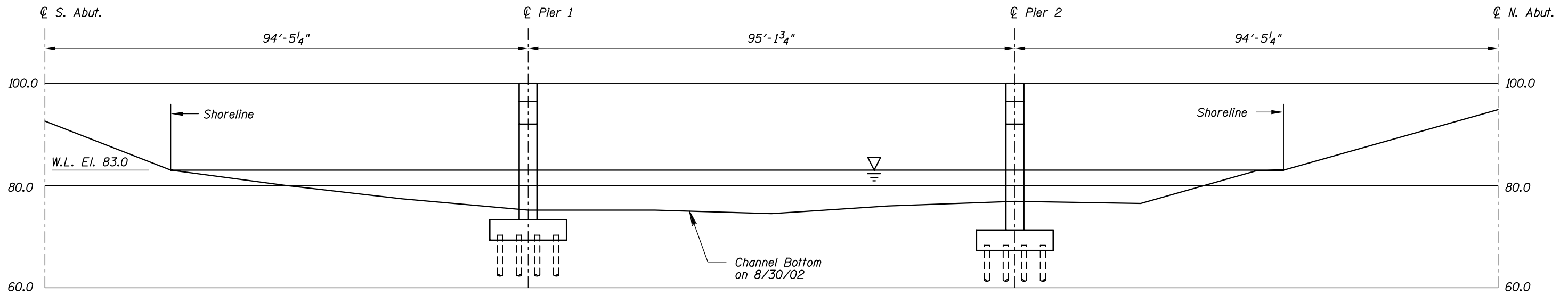
STRUCTURE NO. 69580
OVER THE ST. LOUIS RIVER
DISTRICT I, ST. LOUIS COUNTY

INSPECTION AND SOUNDING PLAN

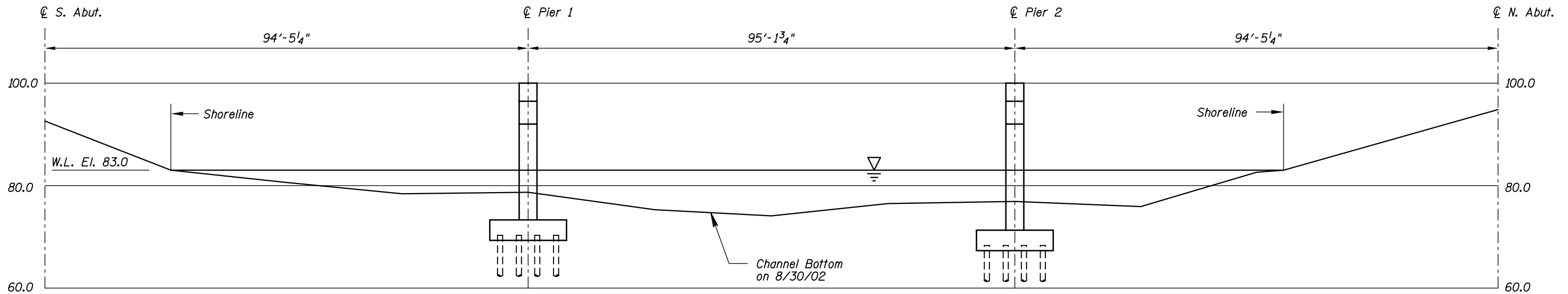
Drawn By: PRH
Checked By: MDK
Code: 35I2000I

COLLINS ENGINEERS, INC.
 300 W. WASHINGTON, STE. 600
CHICAGO, ILLINOIS 60606
(312) 704-9300

Date: AUG. 2002
Scale: NTS
Figure No.: I



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

**MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION**

STRUCTURE NO. 69580
OVER THE ST. LOUIS RIVER
DISTRICT I, ST. LOUIS COUNTY

**UPSTREAM AND DOWNSTREAM
FASCIA PROFILES**

Drawn By: PRH

Checked By: MDK

Code: 35I2000I

COLLINS ENGINEERS, INC.
300 W. WASHINGTON, STE. 600
CHICAGO, ILLINOIS 60606
(312) 704-9300

Date: AUG. 2002

Scale: 1"=20'

Figure No.: 2



Photograph 1. View of Structure, Looking Southeast.



Photograph 2. View of Pier 1, Looking Northeast.



Photograph 3. View of Pier 2, Looking Northeast.



Photograph 4. View of Timber Debris at the Upstream Nose of Pier 2, Looking Southwest.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc.

DATE: August 31, 2002

ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E.

BRIDGE NO: 69580

WEATHER: Cloudy, " 70° F

WATERWAY CROSSED: St. Louis River

DIVING OPERATION: X SCUBA

SURFACE SUPPLIED AIR

OTHER

PERSONNEL: Michelle D. Koerbel, Matthew J. Lengyel

EQUIPMENT: Scuba, U/W Light, Scraper, Lead Line, Sounding Pole, Probe Rod, Camera

TIME IN WATER: 9:15 A.M.

TIME OUT OF WATER: 9:40 A.M.

WATERWAY DATA: VELOCITY " 1.0 fps

VISIBILITY " 2.0 feet

DEPTH 10.5 feet maximum at Pier 2

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the concrete was in good and sound condition with light scaling extending from 3 to 4 feet above the waterline to the channel bottom, with a maximum penetration of 1/8 inch. A heavy accumulation of 2-foot-diameter-and-smaller timber debris was observed at the upstream nose of Pier 2, extending from 3 feet above the waterline to the channel bottom. At Pier 1, only one piece of 6-inch-diameter timber was observed on the channel bottom.

FURTHER ACTION NEEDED: X YES NO

Remove timber debris from around Pier 2 as soon as possible to alleviate flow restrictions, scour influence, and continued accumulation of timber debris at the pier.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 69580
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E. 21491
WATERWAY CROSSED St. Louis River

INSPECTION DATE August 31, 2002
NOTE: USE ALL APPLICABLE CONDITION
DEFINITIONS AS DEFINED IN THE MINNESOTA
RECORDING AND CODING GUIDE INCLUDING
GENERAL, SUBSTRUCTURE, CHANNEL AND
PROTECTION, AND CULVERTS AND WALL
DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	SUBSTRUCTURE						CHANNEL					GENERAL					
			PIILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER (BRACING)	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	8.0'	N	7	N	9	N	7	7	N	8	7	7	7	N	N	N	N	N
	Pier 2	10.5'	N	7	N	9	N	7	7	N	8	5	5	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete was in good and sound condition with light scaling extending from 3 to 4 feet above the waterline to the channel bottom, with a maximum penetration of 1/8 inch. A heavy accumulation of 2-foot-diameter-and-smaller timber debris was observed at the upstream nose of Pier 2, extending from 3 feet above the waterline to the channel bottom. At Pier 1, only one piece of 6-inch-diameter timber was observed on the channel bottom.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.